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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/887,049	06/21/2001	Kie Y. Ahn	MI22-1738	8608

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EXAMINER	
MALDONADO, JULIO J	
ART UNIT	PAPER NUMBER
2823	

DATE MAILED: 08/14/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/887,049	AHN, KIE Y.
	Examiner	Art Unit
	Julio J. Maldonado	2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 June 2001* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *35-62* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *35-62* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 35, 36, 38-42, 45-48, 50-53 and 56-59 are rejected under 35 U.S.C. 102(b) as being anticipated by Val (U.S. 5,323,533).

In reference to claims 35, 36, 40, 45, 50, 51, 56 and 57, Val (Figs.2a-2c) teach a coaxial connection structure comprising a semiconductive substrate (E/12) having an outer surface; a pair of spaced-apart terminal members (P_{E2}/P_{C1}); an inner conductive core (F) spaced from and suspended over the outer surface; a polymer dielectric layer (21) comprising parylene surrounding a substantial portion of the inner conductive core (F); and an outer conductive sheath (24) surrounding a substantial portion of the polymer dielectric layer (21), wherein the outer conductive sheath leaves some void space between the outer conductive sheath and the outer surface and is not formed on the outer surface (column2, line 19 – column 3, line 23).

In reference to claims 38, 39, 41, 42, 46, 47, 48, 52, 53, 58 and 59, Val teaches that the outer conductive sheath (24) leaves some void space between the outer conductive sheath and the outer surface (see Fig.2c); the outer conductive sheath (24) is not formed on the outer surface (see Fig.2c); the polymer dielectric layer (21) has a

dielectric constant of about 2.6 (column 2, lines 47-57); and the outer conductive sheath (24) comprises aluminum (column 3, lines 17-21).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 44, 49, 55 and 61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Val ('533).

Val teach a coaxial connection structure using nickel as conductive material (column 3, lines 17-21). Val fails to expressly teach using nickel as an inner conductive core. however, the selection of a well-known material involves routine skill in the art.

5. Claims 35, 36, 39, 40, 42, 43, 45, 47 and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Loboda (U.S. 6,268,262) in view of Numata et al. (U.S. 5,675,187) and Thomas et al. (U.S. 5,117,276).

In reference to claims 35, 36, 40 and 45, Loboda (Figs.2-10) teaches an air bridge structure having a semiconductive substrate having an outer surface; a pair of spaced-apart terminal members (2) disposed over the outer surface and extending elevationally away therefrom; an inner conductive core (12) operably connected with and suspended between the spaced-apart terminal members (2) above the outer surface; and a dielectric layer (6/10/13) surrounding a substantial portion of the inner conductive core (12) (column 2, line 35 – column 4, line 63).

Loboda fails to teach the dielectric layer comprising parylene. However, Numata et al. (Figs.2-4) teach an interconnect structure having a dielectric layer comprising parylene (column 10, lines 53-65). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to use the parylene dielectric layer as taught by Numata et al. in the air bridge structure of Loboda, since by doing so it would reduce the capacitance between the conducting lines (column 2, line 65 – column 3, line 8).

Still, Loboda in combination with Numata et al. fail to show an outer conductive sheath surrounding a substantial portion of the polymer dielectric layer. However, Thomas et al. (Figs.1-4) in a related art to the formation of interconnections, teach a coaxial line having an outer conductive sheath (54) surrounding a substantial portion of a dielectric layer (column 4, lines 10-28). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to include an outer conductive sheath as taught by Thomas et al. in the air bridge structure of Loboda and Numata et al., since this addition would reduce crosstalk between adjacent lines (column 4, lines 10-28).

In reference to claims 39, 42, 43, 47 and 48, the combined structure of Loboda, Numata et al. and Thomas et al. teach that the outer conductive sheath is not formed on the outer surface (see Thomas et al. Fig.2B); the outer conductive sheath comprises an electrically conductive material (see Thomas et al., column 9, lines 39-42), such as tungsten and aluminum (see Numata et al., table 1); and the inner conductive core comprises copper (see Loboda, column 2, lines 41-47).

6. Claims 54 and 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Val ('533) in view of Loboda ('262).

Val substantially teaches all aspects of the invention but fails to teach that the inner conductive core comprises copper. However, Loboda (Figs.1-10) teaches an air bridge structure including an inner conductive core (12) comprising copper (column 2, lines 41-47 and column 4, lines 41-47). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention was made to use copper as a conductive material for the inner core as taught by Loboda in the coaxial structure of Val, since copper is a cost-effective and good conducting material (column 2, lines 41-47).

7. Claims 37 and 62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Val ('533) in view of Numata et al. ('187).

Val (Figs.2a-2c) teach a coaxial connection structure comprising a semiconductive substrate (E/12) having an outer surface; a pair of spaced-apart terminal members (P_{E2}/P_{C1}); an conductive layer of material (F) spaced from and suspended over the outer surface between the terminal members, the conductive layer comprising gold; a polymer dielectric layer (21) comprising parylene disposed over the conductive layer of material, the dielectric layer surrounding the suspended conductive portions (F); and an outer conductive sheath (24) surrounding a substantial portion of the polymer dielectric layer (21), wherein the outer conductive sheath leaves some void space between the outer conductive sheath and the outer surface and is not formed on the substrate outer surface (column2, line 19 – column 3, line 23).

Val fails to teach a copper-comprising layer operably connected with and suspended above the outer surface between the terminal members and the conductive layer and having a thickness about 100-200 nanometers. However, Numata et al. (Figs.1-4) teach an interconnection structure including a copper-comprising layer (134) operably connected with and suspended above the outer surface between terminal members (114) and a conductive layer (122). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to include a copper comprising layer between the terminal member and the conductive layer as taught by Numata et al. in the coaxial line structure of Val, since this would help to dissipate heat from the terminal layers when the device is in operation (column 8, lines 30-36).

Conclusion

8. Papers related to this application may be submitted directly to Art Unit 2823 by facsimile transmission. Papers should be faxed to Art Unit 2823 via the Art Unit 2823 Fax Center located in Crystal Plaza 4, room 3C23. The faxing of such papers must conform to the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The Art Unit 2823 Fax Center number is **(703) 305-3432**. The Art Unit 2823 Fax Center is to be used only for papers related to Art Unit 2823 applications.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Julio J. Maldonado** at **(703) 306-0098** and between the hours of 8:00 AM to 4:00 PM (Eastern Standard Time) Monday through Friday or by e-mail via julio.maldonado@uspto.gov. If attempts to reach the examiner by telephone

are unsuccessful, the examiner's supervisor, Wael Fahmy, can be reached on (703) 308-4918.

Any inquiry of a general nature or relating to the status of this application should be directed to the **Group 2800 Receptionist** at **(703) 308-0956**.

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